

## ABSTRACT

A series of experiments were conducted to evaluate the allelopathic potential of torpedograss (Panicum repens L.) a noxious perennial grassweed, and 'keppetiya', (Croton lacciferus L.) a shrub weed of the Euphorbiaceae under laboratory and glasshouse conditions. The experiments carried out with torpedograss indicated that torpedograss aqueous extracts, residues (i.e. decomposing in soil, soil-incorporated and applied as 'mulch') and root and rhizome exudates were strongly allelopathic towards certain test species. In general, rhizome tissues caused more phytotoxicity than shoot tissues. Chilli and Tridax were more sensitive indicators than the other crop and weed species tested and were often greatly affected by the torpedograss residues. Similar inhibitory activity of torpedograss residues in both sterile and unsterile soil indicated that the microbial breakdown products were probably not the major source of allelopathic activity by torpedograss. Studies also indicated that the phytotoxicity was biodegradable as evidence by disappearance of toxicity. This study also indicated that the growth suppression of chilli and Tridax was correlated with N deficiency in their tissues. However, the mineral contents of K and Na in plants which grew in the presence of torpedograss residues did not change significantly.

The experiments conducted with Croton lacciferus indicated that aqueous extracts of leaves and residues (i.e. decomposing in soil, soil-incorporated and applied as 'mulch') were allelopathic. Residues promoted the growth of brinjal, chilli and tomato while suppressing the growth of Tridax and to some extent Achyranthes. Soil-incorporated residues showed more toxicity than the surface applied residues. This study also indicated that the toxicity of Croton residues was not dependent on the microbial activity. Presence of high N content in chilli tissues and low K contents in Tridax and Achyranthes tissues were also observed in plants grown in residue incorporated soil.

The plant material of the both species were subjected to activity-directed fractionation on the basis of seed germination bioassays. From torpedograss rhizomes two allelochemicals (i.e. Diosgenin and Palmitic acid) were isolated and characterized by using modern chromatographic methods and multi dimensional NMR techniques. One allelochemical was isolated from Croton leaves and characterization is in progress.